

REMARKS

Claims 21-23, 27-29, 33-35 and 39-41 have been amended to clarify the invention.

No new matter has been entered.

The application of the newly cited U.S. Patent to Farnworth et al. is noted.

Turning first to the rejection of claims 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51 and 54 under 35 USC § 103(a) as obvious over Applicant's admitted prior art (APA) in view of Rostoker (U.S. Patent No. 5,399,898), Farnworth et al. (U.S. Patent No. 5,925,930) and Liang (U.S. Patent No. 5,952,726), claims 21, 24, 27, 33 and 39 have been amended to clarify that at least one bump set comprises at least two pairs of bumps, each pair being formed in any one of the at least two through-holes in the wiring substrate, and electrically connecting the wiring substrate 2 and the at least two chip electrodes 4 connected to the common wiring layer 3 of the semiconductor chip, 4, wherein the at least two pairs of bumps each comprise a first bump 5 and a second bump 6 that are integrated with each other (FIGS. 1-6). No combination of Applicant's APA, Rostoker, Farnworth et al. or Liang can achieve or render obvious these added features. Applicant's APA teaches only one electrode that is connected to a bump in a single through-hole (FIG. 8). Rostoker, Farnworth et al. and Liang do not supply the missing teachings. Rostoker teaches that jumpering bump contacts shown with respect to bump contacts 222c and 222d are respectively connected to an internal conductor 236b via either one of conductive plugs 234a and 234b (FIG. 2b; col. 11, lines 59-60). When a flip-chip (semiconductor chip with bumps) is mounted on a wiring substrate, as shown in FIGS. 5a and 5b, jumpered contacts serve as a means for solving difficult routing problems in a flip-chip assembly by providing an effective "extra" layer of wiring, thus helping to keep signal paths on the wiring substrate in such assemblies as

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

short and simple as possible (col. 12, lines 14-17). Therefore, the bump contacts 222c and 222d cannot both be connected to the same wiring on the wiring substrate. The secondary references to Liang and Farnsworth et al., which appear to be cited primarily for layout or arrangement of bumps on the wiring substrate, do not supply the missing teachings. Thus, no combination of Applicant's APA, Rostoker, Farnsworth et al. and Liang can achieve or render obvious claims 21, 24, 27, 33 and 39, nor any claims dependent therefrom.

Turning now to the rejection of claims 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52 and 55 under 35 USC § 103 as obvious over Applicant's APA, Rostoker, Farnsworth et al. and Liang as applied to claim 21, in further view of Fulcher (U.S. Patent No. 5,686,764), claims 22, 28, 34 and 40 have been amended to include many of the added features of claim 21, and are similarly patentable over the art. The deficiencies of the combination of Applicant's APA, Rostoker, Farnsworth et al. and Liang have been discussed above. Fulcher does not supply the missing teachings to achieve or render obvious claims 22, 28, 34 and 40. Fulcher also is believed to be concerned primarily with layout or arrangement of bumps. Thus, no combination of Applicant's APA, Rostoker, Farnsworth et al., Liang and Fulcher can achieve or render obvious claims 22, 28, 34 and 40, nor any claims dependent therefrom.

Turning finally to the rejection of claims 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53 and 56 under 35 USC § 103 as obvious Applicant's APA in view of Rostoker, Farnsworth et al. and Liang in further view of Bertolet et al. (U.S. Patent No. 5,844,317), claims 23, 29, 35 and 41 have been amended to include many of the features of claim 21, and are similarly patentable over Applicant's APA, Rostoker, Farnsworth et al. and Liang. The deficiencies of the combination of Applicant's APA, Rostoker, Farnsworth et al. and Liang have been discussed above. Bertolet et

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

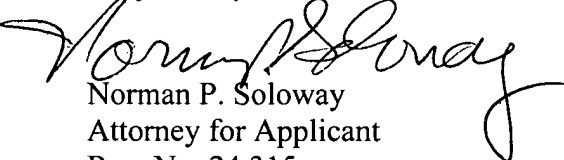
175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

al. also does not supply the missing teaching to achieve or render obvious claims 23, 29, 35 and 41. Bertolet et al., like Liang and Farnsworth et al., is believed to be concerned primarily with the layout or arrangement of bumps. Thus, no combination of Applicant's APA, Rostoker, Farnsworth et al., Liang and Bertolet et al. can achieve or render obvious claims 23, 29, 35 and 41, nor any claims dependent therefrom.

Having dealt with all of the objections raised by the Examiner, the Application is believed to be in order for allowance. Early and favorable action are respectfully requested.


In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,


Norman P. Soloway
Attorney for Applicant
Reg. No. 24,315

CERTIFICATE OF MAILING

I certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to MAIL STOP NON-FEE AMENDMENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 13, 2004 at Tucson, Arizona.

By 

NPS/ALK:nm

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567